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10/782,248	02/18/2004	Gerard Harbers	LUM-03-08-01 US	4994

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EXAMINER	
LOUIE, WAI SING	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/782,248	HARBERS ET AL.	
	Examiner	Art Unit	
	Wai-Sing Louie	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant states that claims 1, 2, and 31 have been amended (in remarks page 7). However, there is no amended claims in the record on the claims submitted on February 20, 2007. Claims 36-42 is cancelled.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-4, 7, 15-21, 29, and 31-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Song (US Pub. 2004/0036980).

With regard to claims 1, 17 and 31, Song discloses an optical pickup apparatus (paragraph [0027] et seq. and fig. 1) comprising:

- A light-emitting diode 110 comprising a chip (paragraph [0065] and fig. 1) having a light-emitting surface that emits light having a range of wavelengths (paragraph [0058]) into a medium (air gap) with a refractive index of less than 1.25 (paragraph [0031]);

- A collimating optical element 120 disposed to receive the light having only the range of wavelengths emitted from the light-emitting surface of the chip 110 (paragraph [0028] and fig. 1), the collimating optical element 120 having an entrance surface, where the medium is disposed between the entrance surface and the light-emitting surface of the chip 110 (fig. 1);
- A micro-display (disc) 200 disposed to receive the light emitted from the light-emitting surface of the chip 110 after the light passes through the collimating optical element 120 (fig. 1).

With regard to claims 3, 18, and 32, Song discloses the collimating optical element 120 is a lens (paragraph [0028]).

With regard to claims 4, 21, and 34, Song discloses a holding element 100 that holds the collimating optical element 120 (fig. 1).

With regard to claims 7, 20, and 33, Song discloses a second collimating optical element 180 is disposed over the collimating element such that the collimating optical element 120 is disposed between the second collimating optical element 180 and the chip 110 (fig. 1).

With regard to claims 15-16 and 29, Song discloses the medium is the ambient air (paragraph [0060]).

With regard to claim 19, Song discloses a micro-display 200 to receive light emitted from the light-emitting surface of the chip 110 after the light passes through the collimating optical element 120 (fig. 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song (US Pub. 2004/0036980).

With regard to claim 2, in addition to the limitations disclosed in claim 1 above, Song also discloses:

- Okazaki does not disclose the collimating optical element 7 are separated by a distance that is less than or equal to approximately 50% of the width of the chip 1. However, the distance or focal length is considered to involve routine optimization, which has been held to be within the level of ordinary skill in the art. As noted in In re Aller, the selection of reaction parameters such as the distance or focal length etc. would have been obvious:

  "Normally, it is to be expected that a change in temperature, or in thickness, or in time, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art...such ranges are termed "critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."

In re Aller 105 USPQ233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmscher 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CCPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

Therefore, one of ordinary skill in the requisite art at the time the invention was made would have used any the distance or focal length suitable to the method of the process in order to optimize the design.

Claims 5, 22, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song (US Pub. 2004/0036980) in view of Waitl et al. (US 6,610,563).

With regard to claims 5, 22, and 35, Song does not disclose a ring shape notch that holds the lens. However, Waitl et al. disclose a holding element (housing) 3 that holds the collimating lens 16, where the ring shape holding element 3 include a notch 6 and the lens has a tab 18 that is held in the notch (Waitl col. 6, line 54 and fig. 2). Waitl et al. teach the ring shape notch traps the casting compound 14 that may overflow the edge (Waitl col. 6, lines 53-54). Therefore, it would have been obvious to one of ordinary skill in the art to modify Song's device with the teaching of Waitl et al. to provide a ring shape notch to trap the casting compound 14 that may overflow the edge.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song (US Pub. 2004/0036980) modified by Waitl et al. (US 6,610,563) as applied to claim 5 above, and further in view of Ishinaga (US 6,180,962).

With regard to claim 6, Song modified by Waitl discloses the LED chip 1 is held and mounted inside a ring element 3 (Waitl fig. 2a), but do not disclose the chip is mounted by reflow soldering. However, Ishinaga discloses the LED chip is soldered onto the base by reflow soldering process (Ishinaga col. 4, lines 11-12). Ishinaga teaches using the reflow process is less likely to damage the semiconductor chip (Ishinaga col. 2, lines 30-32). Thus, it would have been obvious to one of ordinary skill in the art to modify Waitl's device with the teaching of Waitl et al. and Ishinaga to use reflow soldering process to mount the LED chip onto the submount 31 in order to not to damage the chip. Waitl et al. disclose the chip 11 is mounted on the submount 3 and the submount 3 is mounted on housing 3' (Waitl fig. 2c).

Claims 8-12 and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song (US Pub. 2004/0036980) in view of Bogner et al. (US 7,026,657).

With regard to claims 8-10 and 23-25, in addition to the limitations disclosed in claim 1 above, Song also discloses:

- Song does not disclose an array of light-emitting diodes. However, Bogner et al. disclose an array of LEDs in the same module (Bogner fig. 4). Bogner et al. teach a light source comprises an array of LEDs increases the radiation yield (Bogner col. 1, lines 49-55). Hence, it would have been obvious at the time the invention was made to modify Song's device with the teaching of Bogner et al. to provide an array of LEDs in a light source in order to increase the radiation yield. The LED chips are not covered by an encapsulant (Bogner fig. 4).

- A collimating optical element 120 disposed to receive the light having only the range of wavelengths emitted from the light-emitting surface of the chip 110 (paragraph [0028] and fig. 1), the collimating optical element 120 having an entrance surface, where the medium is disposed between the entrance surface and the light-emitting surface of the chip 110 (fig. 1). Song modified by Bogner et al. disclose an integral array of lenses (fig. 4)

With regard to claims 11 and 26, Song modified by Bogner et al. disclose the LED chips is displayed laterally with respect to the center of the associated collimating optical element (Bogner fig. 4).

With regard to claims 12 and 27, Song modified by Bogner et al. disclose the array of chips mounts on a submount 6 (Bogner fig. 4).

Claims 13-14, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song (US Pub. 2004/0036980) in view of Wu (US 6,769,773).

With regard to claim 13-14, 28, and 30, Song discloses a light projection module 100, but does not disclose a micro-display including a wavelength-converting layer. However, Wu discloses a digital-micro-display (DMD) including fluorescent plate to convert the UV light from the light source 70 to emit red, blue and green light (Wu col. 3, lines 36-60 and fig. 10). Wu teaches the display system could activate the UV light into a full color display to replace three different color light sources and transmits a full color display through a programmable projector (Wu col. 1, lines 37-44). Thus, it would have been obvious to one of ordinary skill in the art to

modify Song's device with the teaching of Wu to provide a DMD device including a wavelength-converting layer in order to convert the module into a full color display.

Response to Arguments

Applicant's arguments filed 2/20/2007 have been fully considered but they are not persuasive.

- Applicant argues that Song does not teach or suggest the "light-emitting diode chip 110 having a light-emitting surface emits light having a range of wavelengths". Song discloses the LED 110 is a red laser diode having a wavelength of 650 nm (paragraph [0058]). However, a LED emits light in a range of wavelengths, i.e., a red laser diode would emit a range from orange (620 nm) to near IR (750 nm), where the peak (strongest intensity) is around 650 nm. This is an inherent function of an LED. Therefore, Song meet the claimed limitations of independent claims 1, 17 and 31.
- Applicant argues that Song does not teach or suggest the "light emitting surface is not covered by an encapsulant". Song does not disclose any "encapsulant", "encapsulation", or "encapsulating material" on light-emitting diode chip 110.
- Applicant argues that Song does not teach or suggest the apparatus comprising a micro-display. However, Song discloses an optical disc 200 (micro-display) in the optical module 100 (paragraph [0028]).

- Applicant argues that Song do not disclose the "light-emitting surface that emits light into a med with a refractive index of less than or equal to 1.25". Song discloses the LED 110 emits light into air gap between the LED and lens 120 (fig. 1) and Song discloses the refractive index of air is 1.0 (paragraph [0082]). Song meets all claimed limitations.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wai-Sing Louie/
Primary Examiner, Art Unit 2814

Wsl
September 13, 2007.